MEDICAL SURGE

Capability Definition

Medical Surge is the capability to rapidly expand the capacity of the existing healthcare system (long-term care facilities, community health agencies, acute care facilities, alternate care facilities and public health departments) in order to provide triage and subsequent medical care. This includes providing definitive care to individuals at the appropriate clinical level of care, within sufficient time to achieve recovery and minimize medical complications. The capability applies to an event resulting in a number or type of patients that overwhelm the day-to-day acute-care medical capacity. Planners must consider that medical resources are normally at or near capacity at any given time. Medical Surge is defined as rapid expansion of the capacity of the existing healthcare system in response to an event that results in increased need of personnel (clinical and non-clinical), support functions (laboratories and radiological), physical space (beds, alternate care facilities) and logistical support (clinical and non-clinical equipment and supplies).

Outcome

Injured or ill from the event are rapidly and appropriately cared for. Continuity of care is maintained for non-incident related illness or injury.

Relationship to National Response Plan Emergency Support Function (ESF)/Annex

This capability supports Emergency Support Function:

(ESF) #8: Public Health and Medical Services.

Preparedness Tasks and Measures/Metrics

Activity: ***Develop and Maintain Plans, Procedures, Programs, and Systems***	
Critical Tasks	
Res.C1b 1.5.1	Establish a healthcare system to receive and appropriately treat incident specific casualties or illnesses. This system should be composed of multiple resources from State, sub-State and community resources
Res.C1b 1.9.7.2	Coordinate with WMD/hazmat to develop plans for managing/decontaminating self-presenting contaminated victims off-site
Res.C1b 1.3.8	Identify local, State, sub-State, and interstate mental health and substance abuse professionals or paraprofessionals by survey
Res.C1b 1.9.1	Integrate local, State, and regional mental health and substance abuse professionals or paraprofessionals in response planning, exercises, and drills
Res.C1b 1.11.5	Ensure emergency system patient transport and tracking systems are interoperable with national and Department of Defense systems

Res.C1b 1.10.3	Ensure that comprehensive stress management strategies and programs are in place and available to all emergency responders, support personnel, and healthcare professionals
Res.C1b 1.4.2	Develop medical mutual aid agreements for medical facilities and equipment
Res.C1b 1.15.4	Develop surge capacity plans for Acute Care hospitals
Res.C1b 1.15.5	Coordinate with community healthcare systems when developing surge capacity plans for Acute Care hospital
Res.C1b 1.14.2	Ensure facility based evacuation plans include identification of receiving facilities and transportation assets. Transportation assets should be coordinated and planned out with response partners
Res.C1b 1.14	Develop healthcare system evacuation plans to include receiving facilities and transportation assets that are coordinated on a regional basis
Res.C1b 1.14.1	Identify adequate evacuation transportation assets and receiving facilities with adequate assets
Res.C1b 1.15.3	Develop plans to mitigate identified hazards to medical treatment facilities
Res.C1b 1.11.3	Develop electronic medical records for recording treatment provided and patient self-reporting
Res.C1b 1.3.11	Develop plans to identify staff, and equipment and resources to operate alternate care facilities
Res.C1b 1.15.1	Develop plan to restrict access and secure healthcare and surge facilities
Res.C1b 1.5.6	Develop a local/State regional pharmaceuticals management system that captures current inventory of Metropolitan Medical Response System, Health Resources and Services Administration-hospital, CHEM-PACK caches; ensures a sufficient supply of pharmaceuticals to provide prophylaxis for 3 days to first responders and their families, other key incident response/management personnel, and the general public as determined by local authorities; and tracks the dispensing of pharmaceuticals during the incident

Preparedness Measures	**Metrics**
The healthcare system has the capacity to complete triage, treatment, and initially stabilize 500 cases per million population for patients with symptoms of acute infectious disease – especially smallpox, anthrax, plague, tularemia, and influenza	Yes/No
The healthcare system has the capacity to complete triage, treatment, and initially stabilize 50 cases per million population for patients with symptoms of acute botulinum intoxication, acute chemical poisoning, and nerve agent exposure	Yes/No
The healthcare system has the capacity to complete triage, treatment, and initially stabilize 50 cases per million population for patients suffering burn or trauma	Yes/No
The healthcare system has the capacity to complete triage, treatment, and initially stabilize 50 cases per million population for patients manifesting the symptoms of radiation-induced injury – especially bone marrow suppression	Yes/No
A process is in place to project the demand for Medical Surge (e.g. how many people will need treatment, how long it will take to secure facilities).	Yes/No
A scalable patient tracking system is in place	Yes/No
Plan for community based surge hospital bed surge capacity is in place	Yes/No
A 50-bed nursing subunit – per 50,000 population – can be staffed	Yes/No
At least one healthcare facility that is identified in each defined sub-State region is able to	Yes/No

support initial evaluation and treatment of at least 10 total adult and pediatric patients at a time in negative pressure isolation within 3 hours from the event	
All acute care hospitals have capacity to maintain, in negative pressure isolation, at least one suspected case of a highly infectious disease or a febrile patient with a suspect rash or other symptoms of concern who might be developing a highly communicable disease	Yes/No
Sufficient supply of pharmaceuticals are stored at the healthcare facility to provide prophylaxis for 3 days to hospital personnel (medical and ancillary staff), ,their family members, and hospital based emergency first responders and their families	Yes/No
Sufficient supplies of Personal Protective Equipment are available for current and surge healthcare personnel to work safely within the limits defined by their SOPs	Yes/No
Secure and redundant communications system that provide connectivity during a catastrophic event among healthcare facilities and all other responder disciplines at all jurisdictional levels is in place	Yes/No
Updated medical surge plans have been developed in conjunction with critical multi-disciplinary partners (public health, emergency management agency (EMA), law enforcement, etc.)	Yes/No
Plans address the use of existing facilities (e.g. hospitals, clinics, extended care facilities)	Yes/No
Plans address the identification and setting up of additional facilities (e.g. provision of personnel, equipment, pharmaceuticals) when needed.	Yes/No
Plans address patient and resource transportation (e.g. identification and availability of traditional and non-traditional resources).	Yes/No
Plans address facility based evacuation (e.g. identification of receiving facilities, coordination of transportation assets).	Yes/No
Plans to operate without public utilities for 72 hours are in place	Yes/No
Plans for the set up, staffing, and operation of alternate care facilities are in place	Yes/No
Plans address the treatment of Medical Surge personnel, site staff, and their families (e.g. medical needs, stress management strategies).	Yes/No
Plans address dissemination of accurate, timely, accessible information to public, media, support agencies	Yes/No
A data base to track the status of medical surge resources (e.g. medications, medical professionals) is in place or accessible	Yes/No
A local regional/State regional pharmaceuticals management system is in place that captures current inventory of Metropolitan Medical Response System, Health Resources and Services Administration-hospital, CHEM-PACK caches	Yes/No
A local regional/State regional pharmaceuticals management system is in place that ensures a sufficient supply of pharmaceuticals to provide prophylaxis for 3 days first responders and their families, and other key incident response/management personnel and the general public as determined by local authorities	Yes/No
A local regional/State regional pharmaceuticals management system is in place that tracks the dispensing of pharmaceuticals during the incident	Yes/No

Activity: *Develop and Maintain Training and Exercise Programs*	
Critical Tasks	
Res.C1b 2.1.6	Train designated hospital personnel in National Incident Management System (NIMS), National Response Plan (NRP) and Incident Command System (Hospital Incident Command System)
Res.C1b 2.2.4	Exercise healthcare system, in compliance with appropriate national, State, and local guidance
Res.C1b 2.2.3	Develop and/or implement training, preparedness and exercise programs based on local risk vulnerability assessment, and lessons learned
Res.C1b 2.1.7	Train designated hospital personnel in recognition and treatment of chemical, biological, radiological, nuclear, and explosive (CBRNE) hazards
Res.C1b 2.2.5	Exercise medical surge plans
Res.C1b 2.1.1	Develop and conduct competency-based education and training programs for adult and pediatric pre-hospital, hospital, and outpatient healthcare personnel
Res.C1b 2.1.2	Develop program to train medical and non-medical personnel
Res.C1b 2.1.3	Develop program to train health professions students
Res.C1b 2.2.1	Evaluate emergency management plans through training and multiple methods including drills and exercises at tribal, local, State and national levels
Res.C1b 2.2.2	Exercise all plans on an annual basis to demonstrate proficiency in responding to bioterrorism, other infectious disease outbreaks and other public health threats and emergencies
Res.C1b 2.1.5	Develop just-in-time training programs healthcare workers for unfamiliar critical job functions, and Personal Protective Equipment for specific threats

Preparedness Measures	Metric
Hospitals utilize competency-based education and training programs for all hospital personnel responding to a terrorist incident or other public health emergency	Yes/No
Percent of hospitals that are NIMS/Incident Command System compliant	100%
Percent of acute care facilities that participate in exercises consistent with national and Joint Commission on Accreditation of Healthcare Organizations requirements	75%
Hospitals and their healthcare partners have an exercise program that conforms with Joint Commission on Accreditation of Healthcare Organizations, Health Resources and Services Administration, Center for Disease Control (CDC), NIMS, and Homeland Security Exercise and Evaluation Program (HSEEP) requirements	Yes/No
State participates in Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP) Program	Yes/No

Performance Tasks and Measures/Metrics

Activity: ***Direct Medical Surge Tactical Operations*** **Definition: In response to notification of mass casualty incident, provide overall management and coordination of medical surge operations.**	
Critical Tasks	
Res.C1b 3.7.1	Implement incident response communications within the healthcare system
Res.C1b 3.4.1	Execute medical mutual aid agreements
Res.C1b 3.6	Provide coordination and support for medical care through incident command/ emergency operations center in accordance with the NIMS
Res.C1b 3.6.4.1	Coordinate public health and medical services for those individuals who have been isolated or quarantined
Res.C1b 3.7.2	Provide consistent, accurate and relevant public health and medical information to clinicians, other responders, and the public in a timely manner
Res.C1b 3.7.3	Coordinate with Emergency Public Information to disseminate public health and safety information to the public to improve provision of home healthcare
Res.C1b 3.4.5	Implement emergency credentialing and privileging procedures

Performance Measures	**Metric**
Policies are implemented for security of healthcare facilities and its perimeter during a mass casualty incident or large scale public health emergency	Yes/No
Percent of hospitals in the local regional incident impact area that support the incident recognizing that most regions will only have a couple of hospitals	90%
Timely public health information is disseminated to improve provision of home healthcare and other personal, family, and employer actions	Yes/No
Time in which National Disaster Medical System (NDMS) and other hospital asset reporting and tracking systems are activated	Within 60 minutes from the incident
Time in which deployment actions for the Health and Human Services (HHS) Incident Response Coordination Team are initiated	Within 4 hours from the incident
Time in which the State medical coordinating system is activated	Within 2 hours from notification of the incident
Time in which Federal ESF 8 assets are activated	Within 6 hours from notification of the incident
Time in which deployment actions for the National Disaster Medical System (NDMS) Disaster Medical Assistance Teams (DMAT) are initiated	Within 6 hours from incident
Time in which deployment actions for the National Disaster Medical System (NDMS) Disaster Medical Assistance Teams (DMAT) equipment caches are initiated and activated	Within 24 hours from the incident

Activity: *Activate Medical Surge*	
Definition: In response to a mass casualty incident, activate medical surge through implementation of surge plan	
Critical Tasks	
Res.C1b 4.1	Activate healthcare system incident command
Res.C1b 4.4	Consider the implementation of altered standards of care
Res.C1b 4.6	Activate medical surge plans, procedures, and protocols to ensure medical treatment for populations requiring specialized assistance

Performance Measures	**Metric**
Medical Surge plans are implemented	Yes/No
Personnel are available to augment treatment facilities	Yes/No
Time in which, for cases of a Catastrophic Incident Supplement (CIS) activation, Department of Veteran Affairs (VA) Primary Receiving Centers (PRCs) within 500 miles of an incident venue prepare to terminate non-critical medical services and redirect available resources for receipt of patients at VA medical facilities. Department of Defense (DOD) facilities in the United States will respond under the National Response Plan Pursuant to a Request for Assistance approved by the Secretary of Defense or when directed by the President. DOD facilities within close proximity of the event may be able to render assistance under "Immediate Response Authority."	Within 24 hours from CIS activation
Development of a reconstitution plan is initiated upon identification of Planning Section Chief	Yes/No

Activity: *Implement Surge Patient Transfer Procedures*	
Definition: Transition from pre-event bed utilization to access surge capabilities	
Critical Tasks	
Res.C1b 5.2	Activate alternative care sites and overflow emergency medical care facilities to manage hospital surge capacity
Res.C1b 5.3	Provide knowledge or visibility of available destination medical care facilities/services and tracking for mass movement of patients, ensuring patients are matched with transportation and destinations that provide appropriate levels of medical care

Performance Measures	**Metric**
Systems are in place to identify patients able to be transferred	Yes/No
Time in which patients to discharge are identified	Within 6 hours from notification of requirement to move patients
Resources are available to provide tracking and mass movement of patients	Yes/No
Patient transfers are coordinated with local or State Emergency Operations Center (EOC)	Yes/No
Time in which traditional and non-traditional emergency transport vehicles are	Within 3 hours from

activated	notification
Percent of level of coordination with patient tracking system	100%

Activity: *Implement Surge Staffing Procedures*	
Definition: Maximize staffing levels in accordance with medical surge plans	
Critical Tasks	
Res.C1b 6.1	Activate healthcare workers' and volunteers' call systems
Res.C1b 6.3.1	Support medical surge capability by using volunteer resources
Res.C1b 6.2.1	Mobilize incident-specific medical treatment personnel for pediatrics and adults
Res.C1b 6.2.2	Mobilize non-medical support personnel
Res.C1b 6.3	Assess initial and ongoing need for medical specialists and augment as needed
Res.C1b 6.5	Provide just-in-time training for staff performing non-standard duties
Res.C1b 6.4	Coordinate staff transportation and staging through the State and local EOC
Res.C1b 6.3.2	Coordinate response staffing with Medical Reserve Corps, Metropolitan Medical Response System, Federal and interstate resources, and nongovernmental organizations and faith-based groups

Performance Measures	**Metric**
Percent of healthcare organizations involved in surge that implement call-back procedures	100%
Just-in-time materials and instructions are developed and distributed	Yes/No

Activity: *Receive and Treat Surge Casualties*	
Definition: Receive mass casualties and provide appropriate clinical care	
Critical Tasks	
Res.C1b 7.1.2	Provide treatment appropriate to nature of incident and number of injured/ill
Res.C1b 7.3.1	Ensure adequacy of medical equipment and supplies in support of immediate medical response operations and for restocking supplies/equipment requested
Res.C1b 7.3.3	Coordinate and integrate with local, Federal, and State ESF 8
Res.C1b 7.2.3	Implement comprehensive stress management strategies and programs for all emergency responders and workers
Res.C1b 7.1.3	Provide short-term mental health and substance abuse behavioral health services to the community

Performance Measures	**Metric**
Systems are in place to accrue supplies, pharmaceuticals, and equipment to support facility surge capacity	Yes/No
Percent of patients for whom decontamination is confirmed prior to facility access	100%

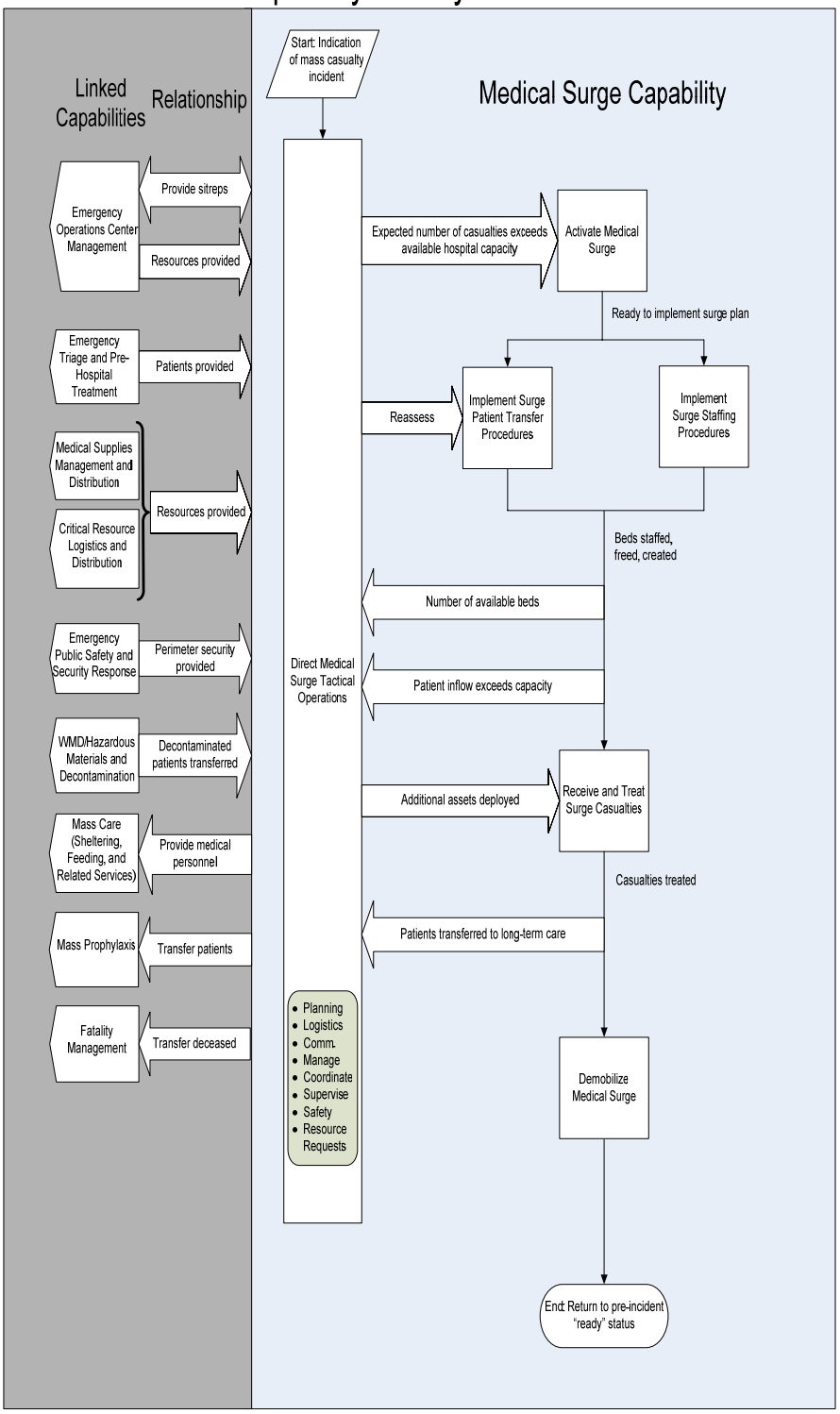
Percent of patients and responders identified, screened, and monitored after an event	100%
Percent of patients tracked from arrival at healthcare system though duration of medical care	100%

Activity: *Demobilize Medical Surge*	
Definition: Prepare to return healthcare system to normal operations	
Critical Tasks	
Res.C1b 8.1	Transition from surge to normal operations
Res.C1b 8.2	Implement plan for reconstitution of healthcare system capabilities
Res.C1b 8.3	Conduct After-Action Reviews and prepare report
Performance Measures	**Metric**
Percent of healthcare system conducting an After-Action Review	100%

Linked Capabilities

Linked Capability	Relationship
Emergency Operations Center Management	Medical Surge and Emergency Operations Center Management provide one another with situation reports. Emergency Operations Center Management also provides resources to Medical Surge as needed.
Emergency Triage and Pre-Hospital Treatment	Medical Surge capability receives patients from Emergency Triage and Pre-Hospital Treatment.
Medical Supplies Management and Distribution	Medical Surge capability receives medical resources from Medical Supplies Management and Distribution.
Critical Resource Logistics and Distribution	Medical Surge capability receives resources from Critical Resource Logistics and Distribution.
Emergency Public Safety and Security Response	Medical Surge receives perimeter security from Emergency Public Safety and Security Response.
WMD/Hazardous Materials and Decontamination	Medical Surge receives decontaminated patients from WMD/Hazardous Materials and Decontamination.
Mass Care (Sheltering, Feeding, and Related Services)	Medical Surge provides medical personnel to Mass Care (Sheltering, Feeding, and Related Services) to conduct treatment of people in shelters.
Mass Prophylaxis	Medical Surge sends patients to Mass Prophylaxis to receive appropriate protection (countermeasures) and treatment.
Fatality Management	Medical Surge capability provides remains to Fatality Management.

Capability Activity Process Flow



Resource Element Description

Resource Elements	Components and Description
Surge bed capacity for infectious disease treatment	Beds above the daily bed capacity for triage treatment and initial stabilization for patients requiring hospitalization with symptoms of acute infectious disease
Other surge bed capacity	Beds above the daily bed capacity for triage treatment and initial stabilization for patients requiring hospitalization with: (1) symptoms of acute botulinum intoxication or other acute chemical poisoning; (2) suffering from burns or trauma or (3) symptoms of radiation-induced injury—especially bone marrow suppression
Surge Healthcare Staff Unit	Minimum staffing level for an acute care center (50-bed nursing subunit) per 12-hour shift: 1 physician, 1 physician's assistant (PA) or nurse practitioner (PN), 6 registered nurses (RN) or a mix of RNs and licensed practical nurses (LPN), 4 nursing assistants/nursing support technicians, 2 medical clerks (unit secretaries), 1 respiratory therapist, 1 case manager, 1 social worker, 1 housekeeper, and 1 patient transporter. Staffing levels will vary and be incident specific. Staffing and support functions will be more efficient as similar patients are treated at individual facilities.
Isolation capacity (1-person)	The capacity to maintain, in negative-pressure isolation, at least one suspected case of a highly infectious disease or a febrile patient with a suspect rash or other symptoms of concern who might be developing a highly communicable disease.
Isolation capacity (10-person)	The capacity to support the initial evaluation and treatment of at least 10 total adult and pediatric patients at a time in negative-pressure isolation.
Regional pharmaceutical cache system	A local regional/State regional pharmaceuticals management system that captures current inventory of Health Resources and Services Administration-hospital, Metropolitan Medical Response System, CHEM-PACK caches; ensures a sufficient supply of pharmaceuticals to provide prophylaxis for 3 days for first responders, their families, other key incident response/management personnel, and the general public as determined by local authorities; and tracks the dispensing of pharmaceuticals during the incident.
Personal protective equipment (PPE)	Adequate personal protective equipment to protect current and additional healthcare personnel. The quantity and type of PPE will be established based on a health vulnerability assessment (HVA) and the level of decontamination that is being designed.
Secure and redundant communications system	Secure and redundant communications system ensures connectivity during a catastrophic incident among healthcare facilities, State and local health departments, emergency medical services, emergency management agencies, public safety agencies, neighboring jurisdictions, and Federal ESF#8 elements. .
Data reporting system	System to report data

Planning Assumptions

General

- Although applicable to several of the 15 National Planning Scenarios, the capability planning factors were developed from an in-depth analysis of the Pandemic Influenza scenario. Other scenarios were reviewed to identify required adjustments or additions to the planning factors and national targets.
- This capability may require support from multiple ESFs and capabilities.
- HHS Secretary can lift Emergency Medical Treatment and Active Labor Act (EMTALA) requirements for 72 hours.
- Each State should review with HHS other restrictions that may need to be lifted or minimized during the time of an emergency such as Critical Access Hospitals, Health Insurance Portability and Accountability Act and Medicare and Medicaid rules.
- Triage done in the field will have a significant impact on the subsequent healthcare surge capacity system.
- This capability applies to a wide range of incidents and emergencies including accidental or deliberate disease outbreaks, natural disasters, nuclear, chemical, and conventional explosive events.
- The professionals listed in the following have basic skill sets commensurate with their professional training and experience qualified by professional licensure and/or industry standards.
- There will be a significant problem locating and providing information on displaced family members as well as victims at treatment facilities.
- Federal, State, and local Emergency Response Plans are activated.
- Non-Federal hospitals of the National Disaster Medical System, as well as Department of Veteran's Affairs (VA) Primary Receiving Center (PRCs) within the local vicinity of the incident are authorized to provide definitive care to casualties of a catastrophic mass casualty incident. DOD facility support is available in response to a Request for Assistance that has been approved by Secretary of Defense or the President
- Public Health Emergency and Stafford declaration will be utilized to enable the Secretary of the Department of Health and Human Services (HHS) to invoke Emergency Hiring Authority and additional resources for additional healthcare assets.
- Alternative Care Facilities (ACFs) are community based medical facilities such as ambulatory surgical centers, which can be rapidly mobilized for medical surge. ACFs are typically buildings that serve a medically-related purpose when not requisitioned for use in an emergency to house patients.
- Ambulatory Care Centers (ACCs) are buildings of opportunity which can be resourced and staffed to provide medical care. The Federal Medical Contingency System (FMCS) can also be incorporated within this structure. These are community facilities that do not necessarily provide a medical function outside of an emergency, but have the space and access needed to house patients (armories, auditoriums, conference centers, firehouses, etc.)
- Response to the overwhelming demand for services will require non-standard (Altered Standards of Care) approaches, including: discharge of all but critically ill hospital patients, expansion of hospital "capacity" by using all available space, less than code compliance beds, relaxation of practitioner licensure requirements as deemed appropriate, such as ratio of staff to patients, and utilization of general purpose and special needs shelters as temporary health facilities.
- Secondary bacterial infections following any mass casualty event will stress antibiotic supplies.
- There will be critical shortages of healthcare resources such as staff, hospital beds, mechanical ventilators, morgue capacity, temporary holding sites with refrigeration for storage of bodies and other resources.
- Routine medical admissions for acute medical and trauma needs will continue.
- Alternate healthcare facility plans are implemented.

- Emergency Use Authorities will be sought.
- Victims and responder monitoring and treatment may be required over a long time frame.
- There may be a denigration of healthcare staff numbers for a variety of causes.
- A large number (75 percent plus) of victims could self-present without field triage or evaluation.
- The "normal" supply chain will likely be disrupted.
- Hospital logistical stores will be depleted in the early hours from any large scale event.
- Blood supplies will be taxed and significant regional shortages could materialize quickly following a catastrophic incident. Blood manufacturing, infectious disease-testing, and distribution of tested blood will be problematic.
- There will be a significant increase and demand for specialty healthcare personnel and beds (biological contagious, burn, trauma, pediatrics) depending on the specific event.
- A large number of patients may self-refer to a healthcare facility requiring decontamination.
- Healthcare providers are subject to the effects of disasters and may need decontamination, prophylaxis, or immunization measures before being able to perform their response roles.
- Patient transportation to and from airheads and medical treatment facilities (MTFs) will be problematic due to excessive congestion on local roads and limited patient movement alternatives (e.g. rotary wing lift).
- Public anxiety related to a catastrophic incident will require effective risk communication and may require mental health and substance abuse services.
- During a catastrophic incident, medical support will be required not only at medical facilities, but in large numbers at casualty evacuation points, evacuee and refugee points, and shelters as well as to support field operations.
- The DHS National Disaster Medical System (NDMS) and HHS U.S. Public Health Service (USPHS) Commissioned Corps assets will be the first Federal health and medical assets to arrive on the scene of a catastrophic event. Although they may not arrive at all.
- Sub-State regions are able to provide and sustain medical surge capacity in a large-scale public health emergency or bioterrorism event. Ideally, each sub-State region will contain one acute care hospital, one emergency medical services agency, and one public health department/district and work with a multitude of various public agencies as well as private and faith based groups, all of which would respond to a wide-scale event.

Scenario-Specific

Pandemic Influenza:

- Pandemic is pervasive and not localized.
- Worst case scenario would produce 733,000 patients hospitalized on any given day.
- Up to 20 percent of those hospitalized (146,600 patients) are critical and will each require a critical care bed and mechanical ventilation, necessitating staff to patient ratios of 1:2 registered nurses (RN) (73,300 RNs), 1:10 physicians (14,660 MDs); 1:5 respiratory therapists (29,320 RTs). Ratios should be consistent with State/sub-State regions
- 80 percent of those hospitalized (586,400 patients) are non-critical and will require a general medical bed, necessitating patient to staff ratios of 1:40 physician (14,660 MDs) and 1:20 RN (29,320 RNs).
- Vaccine availability will be insufficient and time to produce additional vaccine unacceptably long.
- Antiviral drug production will be surged.
- Strategic National Stockpile (SNS) will be depleted.
- 42 million outpatient visits need to be provided with antivirals, antipyretics, analgesics
- 50 million at home on self care are on over-the-counter (OTC) only.

- 1 percent of the hospitalized patient population (7,338) warrants transfer from one healthcare facility to another more than 100 miles.
- 50 percent of the transferring patient population (3,669) will require transfer during one two-month period; the other half (3,669) during a separate two-month period; averaging 61 patients per day, with surging to 200 patients per day for one week.
- 10 percent of transferring patients (total of 733 patients over/during the entire scenario) could travel by commercial means sans medical attendance en route.
- 50 percent are ambulatory (total 3,669) but require medical attendance en route at a rate of 1 nurse per 50 patients.
- 40 percent are restricted to litters (total 2,936) and require medical attendance at a rate of 1 nurse per 20 patients.
- 50 percent of litter patients are critical and require ventilation and 1 nurse per patient (1,468).
- There is a critical need for containment measures to prevent additional disease spread. Specific counter measures such as social distancing, masks, and hand hygiene should be instituted.
- Because of the limited supply and production capacity, there is a need for explicit prioritization of influenza vaccine based on the risk of influenza complications, the likelihood of benefit from vaccination, role as an influenza pandemic responder, and impact of the pandemic on maintenance of critical infrastructure.
- Persons of all ages will likely need 2 doses of vaccine, 3-4 weeks apart in order to be protected.
- Primary prevention including masks, hand hygiene, and social isolation may be the primary mode of preventing the spread of disease if vaccine and viral agents are not available in adequate quantities.

Chemical:

- Most likely route of introduction of a chemical exposure in a mass casualty event will be inhalation.
- There will be a delay in the identification of the chemical.
- All chemicals are toxic depending on the concentration and time spent in that concentration.
- Medical treatment facilities have inadequate decontamination capabilities.
- Chemical events will result in immediate and potentially life threatening injuries.
- Appropriate response will rely on rapid decontamination and a locally deployable, pharmaceutical cache. (i.e., Chempack or Metropolitan Medical Response System)
- Many potential victims may present themselves to healthcare facilities requiring decontamination.

Nuclear Detonation:

- Triage will be a major issue for care providers.
- Decontamination and monitoring will be a major issue.
- As a rule of thumb, the sooner the onset of symptoms and the higher the dose received the less likely the victim will survive.
- Generally, invasive (open) procedures should be performed within the first 48 hours on those receiving significant doses of radiation exposure due to follow on progressive immunocompromised state.
- Critical infrastructure and personnel will be damaged and rendered ineffective for a three mile radius.
- Tens of thousands will require decontamination and both short-term and long-term treatment.
- The evacuated population will require shelter and food for an indefinite time.
- Healthcare facilities and emergency workers in the affected area will be overwhelmed.

- There will be a significant psychological impact on survivors creating long term mental health demands.
- The effects of the radiation will be prevalent for years creating long term health issues.
- Healthcare facilities involved in the affected area will have to be replaced and relocated.
- Triage may identify a significant number of patients who have received lethal doses of radiation with zero chance of survivability who will require palliative care only.
- There is a lack of palliative care resources and planning for large numbers of victims.
- Timely and accurate emergency public health information/crisis information news releases are vital for mitigation and prevention of further health issues.

Planning Factors from an In-Depth Analysis of a Scenario with Significant Demand for the Capability (Pandemic Influenza)

Resource Element	Estimated Capacity	Scenario Requirement Values	Quantity of Resources Needed
Surge bed capacity for infectious disease treatment		733,000 patients hospitalized on a given day	Bed capacity above the current daily staffed bed capacity to allow for triage, treatment, and initial stabilization for 500 cases per million population for patients with symptoms of acute infectious disease
Other surge bed capacity			Bed capacity above the current daily staffed bed capacity to allow for triage, treatment, and initial stabilization for: 50 cases per million population for patients with symptoms of acute botulinum intoxication, acute chemical poisoning, and nerve agent exposure 50 cases per million population for patients suffering from burns or trauma 50 cases per million population for patients manifesting the symptoms of radiation-induced injury—especially bone marrow suppression
Surge Healthcare Staff Unit	Staff teams needed per 12-hour shift		
Regional pharmaceutical cache system			
Personal protective equipment (PPE)			The quantity and type of PPE will be established based on a hazardous vulnerability analysis (HVA) and the level of decontamination that is being designed
Secure and redundant communications system			

Target Capability Preparedness Level

Resource Element Unit	Type of Element	Number of Units	Unit Measure (number per x)	Lead	Capability Activity supported by Element
Beds - Surge capacity for infectious disease treatment	Equipment	500	Per million population	Federal/State/ Local (City, Intrastate region)	Receive and Surge Treat Casualties
Beds - Surge capacity for other treatment	Equipment	50	Per million population	Federal/State/ Local (City, Intrastate region)	Receive and Surge Treat Casualties
Surge Healthcare Staff Unit (Option 1 – for establishing acute care center)	Non-NIMS Resource Organization	2	Per 50-bed unit	Local (Intrastate region)	Receive and Surge Treat Casualties
Surge Healthcare Staff Unit (Option 2 - for surge support to existing healthcare facility)	Non-NIMS Resource Organization	1	Per surge bed assuming a 1:4 staff to patient ratio	Local (Intrastate region)	Implement Surge Staffing Procedures Receive and Surge Treat Casualties
Surge Healthcare Staff Unit (Option 2 - for surge support to existing healthcare facility	Non-NIMS Resource Organization	1.4	Per surge bed assuming a 1:6 staff to patient ratio	Local (Intrastate region)	Implement Surge Staffing Procedures Receive and Surge Treat Casualties
Isolation capacity (1-person)	Equipment	1	Per Healthcare facility	Local (Intrastate region)	Receive and Surge Treat Casualties
Isolation capacity (10-person)	Equipment	1	Per Regional healthcare facility	State	Receive and Surge Treat Casualties
Regional Pharmaceutical cache system	Equipment	1	Per Public health region	State	Receive and Surge Treat Casualties
Personal protective equipment (PPE)	Equipment	1	Per Healthcare provider (person)	State/Local (City, Intrastate region)	Receive and Surge Treat Casualties

References

1. Homeland Security Presidential Directive/HSPD–8: National Preparedness. The White House, Office of the Press Secretary. December 2003. http://www.whitehouse.gov/news/releases/2003/12/20031217-6.html
2. National Response Plan. U.S. Department of Homeland Security. December 2004.

3. National Incident Management System. U.S. Department of Homeland Security. March 2004. http://www.dhs.gov/interweb/assetlibrary/NIMS-90-web.pdf.
4. Resource Typing Definitions–I: First 60 Resources. National Mutual Aid and Resource Management Initiative. U.S. Department of Homeland Security, Federal Emergency Management Agency. January 2004. http://www.fema.gov/pdf/preparedness/initial_60_rtd.pdf.
5. Hazardous Waste Operations and Emergency Response, 29 CFR 1910.120. Occupational Safety and Health Administration. November 2002. http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9765.
6. Medical Personnel Exposed to Patients Contaminated With Hazardous Waste. Standard interpretation. Occupational Safety and Health Administration. March 1992. http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=20609.
7. OSHA Best Practices for Hospital-Based First Receivers of Victims from Mass Casualty Incidents Involving the Release of Hazardous Substances. Occupational Safety and Health Administration. January 2005. http://www.osha.gov/dts/osta/bestpractices/html/hospital_firstreceivers.html.
8. Altered Standards of Care in Mass Casualty Events. AHRQ Publication No. 05–0043. Agency for Healthcare Research and Quality. April 2005. http://www.ahrq.gov/research/altstand/.
9. DHS, Office for Domestic Preparedness. Metropolitan Medical Response System (MMRS) Program. http://fema.mmrs.gov
10. Model Trauma System Planning and Evaluation, self-assessment tool for States, Department of Health and Human Services, Health Resources and Services Administration, http://www.hrsa.gov/trauma/model.htm, February 2006.